UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,848	04/05/2007	Naoto Okino	09812.0084	5005

22852 7590 01/11/2011

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
KESSLER, GREGORY AARON	
ART UNIT	PAPER NUMBER
2196	

MAIL DATE	DELIVERY MODE
01/11/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/580,848	OKINO ET AL.	
	Examiner	Art Unit	
	GREGORY A. KESSLER	2196	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 May 2008* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-13 are presented for examination. Claims 1-3, 5-9, and 11-13 are amended.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The disclosure is objected to because of the following informalities:

- In Paragraph [0015], Line 3, “OS’s” should be “OSs”.
- In Paragraph [0015], Line 4, “an main” is unclear.
- In Paragraph [0015], Line 6, “interrupt enabled” should be “interrupt-enabled” and "interrupt disabled" should be "interrupt-disabled".
- In Paragraph [0016], Lines 6-7, “interrupt enabled” should be “interrupt-enabled” and "interrupt disabled" should be "interrupt-disabled".

Appropriate correction is required.

4. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are shown above under heading number three.

The examiner would like to expressly point out that the examples under heading number three are only the first of many examples of such text requiring revision. The entirety of the specification should be revised to the same standards.

Drawings

5. The drawings are objected to because Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the elements of claims 3 (the main operating system updating the status in response to the notification from the sub operating system), 5 (flowchart involving the ifs and how they are each handled – if this information is included in the sequences of Figure 7, it needs to be more clearly illustrated in a drawing), 6 (flowchart involving the ifs and how they are each handled – if this information is included in the sequences of Figure 7, it needs to be more clearly

illustrated in a drawing) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

7. Claim 13 is objected to because of the following informalities: in lines 1-2, "computer readable" should be "computer-readable". Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The claim language of the following claims is not clearly understood:

i. As to claim 1, line 15, claim 7, line 12, and claim 13, line 14, it is unclear what it means for an operating system to be in an "interrupt enabled-state" or an "interrupt-disabled state". For purposes of this action, it is assumed to mean that the operating system is either accepting interrupts (enabled) or ignoring them (disabled).

ii. As to claim 1, line 17, claim 7, line14, and claim 13, line 16, it is unclear how the status information is used in the controlling of the interrupt process. What is the role of the status information in the performance of an interrupt process execution or an interrupt process reserve?

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claim 13 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

11. As per claim 13, the claim is drawn to a "computer readable medium". The specification is silent regarding the meaning of this term. Thus, applying the broadest reasonable interpretation in light of the specification and taking into account the meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art (MPEP 2111), the claim as a whole covers both transitory and non-transitory media. A transitory medium does not fall into any of the four categories of invention (process, machine, manufacture, or composition of matter).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1, 3, 7, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over England et al (**U.S. Pat. Pub. No. 2004/0230794 A1, hereinafter England**) in view of **Magenheimer, Daniel J., et al, "vBlades: Optimized Paravirtualization for the Itanium Processor Family", May 6-7, 2004, hereinafter Magenheimer**, and further in view of Nota et al (**U.S. Pat. No. 5805790, hereinafter Nota**).

England and Nota were cited in the previous office action.

14. As per claim 1, England teaches the limitations substantially as claimed, including an information processing apparatus for processing data, the information processing apparatus comprising:

a plurality of operating systems (Abstract, Lines 1-2) and a processor and memory (Figure 1, Elements 120 and 130), the plurality of operating systems including a main operating system controlling an interrupt process (Paragraph [0119], Lines 1-8) and a sub operating system (Abstract, Lines 1-4), the main operating system, along with a system control operating system set as the sub operating system, setting a logical partition as a process unit, and managing a hardware resource relating to the logical partition (Paragraph [0007], Lines 1-8), the sub operating system operating within the

logical partition set by the main operating system and the system control operating system (Paragraph [0007], Lines 1-8), and executing a software application program with the hardware resource assigned to the logical partition (Paragraph [0086], Lines 1-6), and the main operating system controlling the interrupt process to perform one of an interrupt process execution and an interrupt process reserve (Paragraph [0119], Lines 1-8).

England does not expressly teach storing status information, in the memory, as to whether the sub operating system is in an interrupt-enabled state or an interrupt-disabled state and controlling of the interrupt process, based on the status information, in response to the generation of the interrupt based on the status information.

However, Magenheimer teaches storing, in the memory, status information as to whether the sub operating system is in an interrupt-enabled state or an interrupt-disabled state (Page 7, Lines 1-3) and controlling the interrupt process, based on the status information, in response to the generation of the interrupt (Page 7, Lines 1-4 teach that the interrupt process is controlled by the status information, such that the interrupt process is reserved in the case that the status information disables interrupts).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Magenheimer with those of England in order to ensure that England's apparatus was aware of the proper procedures to undertake

when an interrupt occurred in a guest operating system so that the interrupt could be handled properly.

England and Magenheimer do not expressly teach that the status information is stored by the main operating system.

However, Nota teaches that the status information is stored by the main operating system (Figure 2; Figure 14; Col. 15, Lines 44-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Nota with those of England and Magenheimer in order to allow for England's and Magenheimer's apparatus to ensure that the main operating system always had all relevant processing information available to it in order to ensure more efficient interrupt processing.

15. As per claim 3, Nota teaches that the sub operating system notifies the main operating system of the status information as to whether the sub operating system is in the interrupt-enabled state or the interrupt-disabled state (Col. 4, Lines 50-51), and wherein the main operating system updates the status information of the sub operating system in response to the notification from the sub operating system (Figure 2; Figure 14; Col. 15, Lines 44-50).

16. As per claim 7, it is a method claim of apparatus claim 1 with an additional limitation. Those limitations that correspond to limitations from claim 1 are rejected for the same reasons.

As to the further limitations, England teaches detecting the generation of an interrupt (Paragraph [0119], Lines 1-8).

17. As per claim 9, it is a method claim of apparatus claim 3. Therefore, it is rejected for the same reasons.

18. As per claim 13, it is a computer program claim of apparatus claim 1 with an additional limitation. Those limitations that correspond to limitations from claim 1 are rejected for the same reasons.

As to the further limitations, England teaches detecting the generation of an interrupt (Paragraph [0119], Lines 1-8).

19. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over England, Magenheimer, and Nota, as applied to claim 1 above, and further in view of Brelsford et al (**U.S. Pat. No. 4674038, hereinafter Brelsford**).

Brelsford was cited in the previous office action.

20. As per claim 2, Nota teaches that the main operating system stores interrupt process status information (Figure 2; Figure 14; Col. 15, Lines 44-50) and resumes the interrupt process execution in response to the transition of the sub operating system between the interrupt-enabled state and the interrupt-disabled state (Col. 16, Lines 35-40).

England, Magenheimer, and Nota do not expressly teach that the status information includes information as to whether the interrupt process is in progress or in reserve.

However, Brelsford teaches that the status information includes information as to whether the interrupt process is in progress or in reserve (Col. 2, Lines 42-45).

It would have been obvious to one of ordinary skill in the art to combine the teachings of Brelsford with those of England, Magenheimer, and Nota in order to ensure that England's, Magenheimer;s, and Nota's main operating system had as much information as was available to use in handling interrupts in sub operating systems.

21. As per claim 8, it is a method claim of apparatus claim 2. Therefore, it is rejected for the same reasons.

22. Claims 4, 6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over England, Magenheimer, and Nota, as applied to claim 1 above, and further in view of Balasubramanian (**U.S. Pat. No. 6633942**).

Balasubramanian was cited in the previous office action.

23. As per claim 4, England, Magenheimer, and Nota do not expressly teach that the main operating system stores priority information of the interrupt process, and performs the interrupt process responsive to the priority information.

However, Balasubramanian teaches that the main operating system stores priority information of the interrupt process, and performs the interrupt process responsive to the priority information (Col. 4, Lines 3-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Balasubramanian with those of England and Nota in order to ensure that England's, Magenheimer's, and Nota's main operating system handled interrupts in an order that allowed the most important computing tasks to be completed efficiently.

24. As per claim 6, Nota teaches that the main operating system performs status management based on a status table containing the status information of the sub operating system and the interrupt process status information (Figure 2; Figure 3;

Figure 14; Col. 15, Lines 44-50) and England teaches that if an interrupt intended for the main operating system is generated, performs interrupt control depending on whether the operating system operating on a processor is either the main operating system or the sub operating system in a manner such that

(a) if the main operating system is in operation, the main operating system executes the interrupt process (Paragraph [0116], Lines 1-6), and that

(b) if the sub operating system is in operation, the main operating system

(b1) executes the interrupt process in response to a high-priority interrupt (Paragraph [0119], Lines 1-8), or

(b2) reserves the interrupt process in response to a low-priority interrupt.

England, Magenheimer, and Nota do not expressly teach priority levels of interrupts.

However, Balasubramanian teaches priority levels of interrupts (Col. 4, Lines 3-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Balasubramanian with those of England and Nota in order to ensure that England's, Magenheimer's, and Nota's main operating system handled interrupts in an order that allowed the most important computing tasks to be completed efficiently.

25. As per claims 10 and 12, they are method claims of apparatus claim 4 and 6, respectively. Therefore, they are rejected for the same reasons.

26. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over England, Magenheimer and Nota, as applied to claim 1 above, and further in view of Brelsford, and still further in view of Tanaka et al (**U.S. Pat. No. 5499379, hereinafter Tanaka**).

Tanaka was cited in the previous office action.

27. As per claim 5, Nota teaches that the main operating system performs status management based on a status table containing the status information of the sub operating system and the interrupt process status information (Figure 2; Figure 3; Figure 14; Col. 15, Lines 44-50). England further teaches that if an interrupt intended for the sub operating system is generated and the main operating system determines based on the status table that the sub operating system is in the interrupt enabled state, performs interrupt control depending on whether the operating system operating on a processor is either the main operating system or the sub operating system in a manner such that

(a) if the main operating system is in operation, the main operating system

(a1) executes the interrupt process in response to a high priority interrupt, or

(a2) reserves the interrupt process in response to a low priority interrupt, and that

(b) if the sub operating system is in operation, the main operating system executes the interrupt process regardless of the priority level of the interrupt (Paragraph [0119], Lines 1-8 teaches that the main operating system executes an interrupt generated for the sub operating system when the main operating system is in operation).

England, Magenheimer, and Nota do not teach that the status information includes information as to whether the interrupt process is in progress or in reserve or that if an interrupt intended for the sub operating system is generated and the main operating system determines based on the status table that the sub operating system is in the interrupt disabled state, registers the interrupt in the status table as a reserved interrupt.

However, Brelsford teaches that the status information includes information as to whether the interrupt process is in progress or in reserve (Col. 2, Lines 42-45).

It would have been obvious to one of ordinary skill in the art to combine the teachings of Brelsford with those of England and Nota in order to ensure that England's, Magenheimer's, and Nota's main operating system had as much information as was available to use in handling interrupts in sub operating systems.

England, Magenheimer, Nota, and Brelsford do not teach that if an interrupt intended for the sub operating system is generated and the main operating system determines based on the status table that the sub operating system is in the interrupt disabled state, registers the interrupt in the status table as a reserved interrupt.

However, Tanaka teaches that that if an interrupt intended for the sub operating system is generated and the main operating system determines based on the status table that the sub operating system is in the interrupt disabled state, registers the interrupt in the status table as a reserved interrupt (Col. 19, Lines 21-26).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Tanaka with those of England, Magenheimer, Nota, and Brelsford in order to allow for England's, Magenheimer's, Nota's, and Brelsford's main operating system to have greater flexibility in how to treat different interrupts, based on their individual circumstances.

28. As per claim 11, it is a method claim of apparatus claim 5. Therefore, it is rejected for the same reasons.

Response to Arguments

29. Applicant's arguments filed on 12/13/2010 have been fully considered but they are not persuasive.

30. With respect to prior art rejections, applicant argues the following in the remarks:

a. England does not teach "the main operating system, along with... the sub operating system... managing a hardware resource relating to the logical partition".

31. The examiner respectfully disagrees with the applicant:

a. England, in Paragraph [0007], teaches that “the host operating system provides the guest with resources such as memory and processor time". The memory and processor are both hardware resources, which are clearly being managed by the host (or main) operating system and provided to the guest (or logical partition). As they are provided to the guest operating system, it is clear that they relate to the guest.

32. Applicant's further arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY A. KESSLER whose telephone number is (571)270-7762. The examiner can normally be reached on Monday - Friday, 7:30 a.m. - 5:00 p.m., alternate Fridays, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emerson Puente can be reached on (571)272-3652. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GREGORY A KESSLER/
Examiner, Art Unit 2196

/Emerson C Puente/
Supervisory Patent Examiner, Art Unit 2196